

I Claim:

1. A process for forming a multilayer three-dimensional structure, comprising:
  - (a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;
  - (b) repeating the forming operation of (a) one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;wherein the forming of at least one layer, comprises:
  - (1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;
  - (2) supplying a mask that comprises at least one void and at least one surrounding protrusion of material;
  - (3) bringing the at least one protrusion of the mask into proximity to or into contact with the substrate so as to form at least one electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and
  - (4) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a desired modification of the substrate occurs,wherein the surface of the protrusions that are brought in proximity to or in contact with the substrate are relatively non-deformable.
2. The process of claim 1 wherein the mask is used with proximity positioning.
3. The process of claim 1 wherein the mask is used with contact positioning.
4. The process of claim 1 wherein the mask is an electrodeless mask.

5. The process of claim 1 wherein the mask comprises an electrode that is used for deposition or etching.

6. The process of claim 1 wherein the desired modification comprises a selectively deposit material.

7. The process of claim 6 additionally comprising a planarization of the deposited material.

8. The process of any of claims 6, wherein the mask is used to selectively deposit material and an etching operation is performed after the deposition to reduce the presence of any unwanted depositions.

9. The process of claim 1 wherein the desired modification comprises a selective etching material from the substrate.

10. The process of claim 9 additionally comprising a planarization of the deposited material.

11. A process for forming a multilayer three-dimensional structure, comprising:  
(a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;

(b) repeating the forming operation of "(a)" one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;

wherein the forming of at least one layer, comprises:

(1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;

(2) supplying a mask that comprises a support material and at least one void and at least one surrounding protrusion of material;

(3) bringing the at least one protrusion of the mask into proximity to or into contact with the substrate so as to form at least one electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and

(4) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a desired modification of the substrate occurs,

wherein the support material is not rigid or where substantially all portions of the mask have similar flexibilities.

12. A process for forming a multilayer three-dimensional structure, comprising:

(a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;

(b) repeating the forming operation of "(a)" one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;

wherein the forming of at least one layer, comprises:

(1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;

(2) supplying a mask that comprises at least one void and at least one surrounding protrusion of material;

(3) bringing the at least one protrusion of the mask into a proximity but not completely contacting position with the substrate so as to form at least one an electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and

(4) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a desired modification of the substrate occurs.

13. A process for forming a multilayer three-dimensional structure, comprising:
- (a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;
  - (b) repeating the forming operation of "(a)" one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;
- wherein the forming of at least one layer, comprises:
- (1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;
  - (2) supplying a mask that comprises at least one void and at least one surrounding protrusion of material;
  - (3) bringing the at least one protrusion of the mask into proximity to or into contact with the substrate so as to form at least one electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and
  - (4) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a desired modification of the substrate occurs,
- wherein the protrusion comprises at least two different materials where the material that is brought in proximity to or in contact with the substrate is less conformable than another material from which the at least one protrusion is comprised.

14. A process for forming a multilayer three-dimensional structure, comprising:
- (a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;
  - (b) repeating the forming operation of "(a)" one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;
- wherein the forming of at least one layer, comprises:

- (1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;
- (2) supplying a mask that comprises at least one void and at least one surrounding protrusion of material;
- (3) bringing the at least one protrusion of the mask into proximity to or into contact with the substrate so as to form at least one electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and
- (4) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a desired modification of the substrate occurs,

wherein the mask comprises at least two different materials where the material that is brought in proximity to or in contact with the substrate is less conformable than another material from which the mask is comprised.

15. The process of claim 14 wherein the mask is an electrodeless mask.
16. The process of claim 14 wherein the mask comprises an electrode that is used for deposition or etching.
17. The process of claim 14 wherein the desired modification comprises a selectively deposit material.
18. The process of claim 17 additionally comprising a planarization of the deposited material.
19. The process of any of claims 17, wherein the mask is used to selectively deposit material and an etching operation is performed after the deposition to reduce the presence of any unwanted depositions.

20. The process of claim 14 wherein the desired modification comprises a selective etching material from the substrate.
21. The process of claim 20 additionally comprising a planarization operation.
22. A process for forming a multilayer three-dimensional structure, comprising:
- (a) forming a layer of at least one material on a substrate that may include one or more previously deposited layers of one or more materials;
  - (b) repeating the forming operation of (a) one or more times to form at least one subsequent layer on at least one previously formed layer to build up a three-dimensional structure from a plurality layers;
- wherein the forming of at least one layer, comprises:
- (1) supplying a substrate on which one or more successive depositions of one or more materials may have occurred and will occur;
  - (2) supplying a mask that is either adhered to the substrate, made to contact the substrate, or that is placed in proximity to the substrate, where the mask comprises at least one void and at least one surrounding protrusion of material, and wherein the positioning of the mask relative to the substrate forms at least one electrochemical process pocket having a desired registration with respect to any previous depositions and providing a desired electrolyte within the at least one electrochemical process pocket; and
  - (3) applying a desired electrical activation between at least one electrode, that may be part of the mask or separate therefrom, and the substrate, such that a selective deposition to the substrate occurs;
  - (4) after application of the a desired electric activation, removing the mask from its adhered, contacted, or proximate positioning to the substrate; and
  - (5) performing an etch of the deposited material to at least partially clean up any deposition of material that occurred in a region of the substrate that was intended to be masked.
- wherein the surface of the protrusions that are brought in proximity to or in contact with the substrate are relatively non-deformable.